Appendix B: Mainstem Kansas River Water Quality

As noted in the summary information, the Kansas River is the eventual receiving stream for over 50,000 square miles of land stretching back Nebraska and Colorado. It is unreasonable to expect a volunteer watershed team to have a major impact on water quality in the river when so many upstream sources remain contributors. However some knowledge of the water quality in this important public recreational resource is useful to have on hand. Below is summary information for the four monitoring stations along the mainstem of the Kansas river within and just downstream of these two HUC 8s. No attempt has been made to link these concentrations to discharge, as has been done where available in the remainder of this document.

A number of active TMDLs exist on this stretch of river, as well as current 303(d) listings. Interested readers are referred to those documents for more detailed information on the sources and causes of pollution along the river. The data included in these tables are drawn from 1985 onward, a somewhat longer period of record than those available on most of the other monitoring stations. All data available in the KDHE database are included to provide the most complete picture of water quality possible. Over the last 20 years some major improvements have been made to wastewater treatment along the main river, particularly with regard to disinfection of effluent. Those impacts will be less apparent in our monitoring data because monitoring of E. coli began in 2003. Other major upgrades to major treatment plants have also had measurable effects on water quality, though improvements can still be made through increased adoption of biological nutrient removal (BNR).

Non-point source reductions can also have some effect on the water quality in the mainstem Kansas River. The majority of the cropland in these two HUC 8s is located in the rich alluvial soils adjacent to the main river. Previous studies have documented the importance of riparian forestry in protecting the river banks, by comparing aerial photographs of the Kansas River before and after the 1993 flood in areas of differing forest density. Areas with greater forest density generally lost less land to the river than those areas with low riparian forest density. Appropriate use of agricultural chemicals and fertilizer may have some impact on the conditions observed in the river, though distinguishing such effects will be complicated because of the magnitude of other sources impacting the river.

Kansas River at Ogden	TP	TSS	Turbidity	TOC	Kjeldahl	E. coli	TN
(SC518)	Median	Median	Median	Median	Median	Median	Median
	0.2765	97		6.153			1.41
Overall	(180)	(180)	37 (180)	(44)	0.99 (51)	20 (31)	(51)
	0.42	216.5		8.4195		108.5	1.708
Spring	(62)	(62)	82 (62)	(16)	1.307 (18)	(10)	(18)
	0.296			5.924	1.0475		1.3625
Summer-Fall	(46)	95 (46)	42 (46)	(11)	(12)	36 (8)	(12)
	0.2105	44.5		5.417			1.188
Winter	(72)	(72)	16.95 (72)	(17)	0.701 (21)	10 (13)	(21)
Kansas River at Wamego	TP	TSS	Turbidity	TOC	Kjeldahl	E. coli	TN
(SC260)	Median	Median	Median	Median	Median	Median	Median
	0.279	74	31.95	5.913			1.778
Overall	(258)	(254)	(258)	(47)	0.992 (54)	36 (32)	(54)
	0.32	118		7.08			1.97
Spring	(87)	(85)	58 (87)	(17)	1.16 (19)	52 (11)	(19)
	0.31			5.507			1.766
Summer-Fall	(63)	80 (63)	38 (63)	(12)	1.074 (13)	52 (8)	(13)
	0.2325	36		5.515			1.6115
Winter	(108)	(106)	14.5 (108)	(18)	0.826 (22)	10 (13)	(22)
Kansas River at Willard	TP	TSS	Turbidity	TOC	Kjeldahl	E. coli	TN
Kansas River at Willard (SC259)	Median	Median	Turbidity Median	Median	Kjeldahl Median	E. coli Median	Median
(SC259)	Median 0.27	Median 88	Median	Median 5.996	Median	Median	Median 1.676
	Median	Median 88 (179)		Median 5.996 (46)	Median 0.948 (53)	Median 62 (31)	Median 1.676 (53)
(SC259) Overall	Median 0.27 (179) 0.33	Median 88 (179) 122	Median 35 (179)	Median 5.996 (46) 7.282	Median 0.948 (53) 1.5075	Median 62 (31) 74.5	Median 1.676 (53) 2.1385
(SC259)	Median 0.27 (179) 0.33 (63)	Median 88 (179)	Median	Median 5.996 (46) 7.282 (16)	Median 0.948 (53)	Median 62 (31)	Median 1.676 (53) 2.1385 (18)
(SC259) Overall Spring	Median 0.27 (179) 0.33 (63) 0.3	Median 88 (179) 122 (63)	Median 35 (179) 53 (63)	Median 5.996 (46) 7.282 (16) 6.004	Median 0.948 (53) 1.5075 (18)	Median 62 (31) 74.5 (10)	Median 1.676 (53) 2.1385 (18) 1.582
(SC259) Overall	Median 0.27 (179) 0.33 (63) 0.3 (45)	Median 88 (179) 122	Median 35 (179)	Median 5.996 (46) 7.282 (16) 6.004 (12)	Median 0.948 (53) 1.5075 (18) 0.973 (13)	Median 62 (31) 74.5	Median 1.676 (53) 2.1385 (18) 1.582 (13)
(SC259) Overall Spring Summer-Fall	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22	Median 88 (179) 122 (63) 88 (45)	Median 35 (179) 53 (63) 44 (45)	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215	Median 62 (31) 74.5 (10) 110 (8)	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615
(SC259) Overall Spring Summer-Fall Winter	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71)	Median 88 (179) 122 (63) 88 (45) 37 (71)	Median 35 (179) 53 (63) 44 (45) 16 (71)	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18)	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22)	Median 62 (31) 74.5 (10) 110 (8) 31 (13)	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22)
(SC259) Overall Spring Summer-Fall Winter Kansas River at	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN
(SC259) Overall Spring Summer-Fall Winter	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median	Median 35 (179) 53 (63) 44 (45) 16 (71)	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22)	Median 62 (31) 74.5 (10) 110 (8) 31 (13)	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median
(SC259) Overall Spring Summer-Fall Winter Kansas River at Lecompton (SC257)	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median 0.31	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median 98	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity Median	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median 6.342	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl Median	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli Median	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median 1.859
(SC259) Overall Spring Summer-Fall Winter Kansas River at	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median 0.31 (221)	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median 98 (217)	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median 6.342 (41)	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median 1.859 (49)
(SC259) Overall Spring Summer-Fall Winter Kansas River at Lecompton (SC257) Overall	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median 0.31 (221) 0.355	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median 98 (217) 147.5	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity Median 40 (221)	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median 6.342 (41) 7.2775	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl Median 1.292 (49)	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli Median 85 (27)	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median 1.859 (49) 1.985
(SC259) Overall Spring Summer-Fall Winter Kansas River at Lecompton (SC257)	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median 0.31 (221) 0.355 (74)	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median 98 (217) 147.5 (72)	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity Median	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median 6.342 (41) 7.2775 (14)	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl Median	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli Median	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median 1.859 (49) 1.985 (17)
(SC259) Overall Spring Summer-Fall Winter Kansas River at Lecompton (SC257) Overall Spring	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median 0.31 (221) 0.355 (74) 0.38	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median 98 (217) 147.5 (72) 132	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity Median 40 (221) 57.4 (74)	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median 6.342 (41) 7.2775 (14) 6.7535	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl Median 1.292 (49) 1.672 (17)	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli Median 85 (27) 70.5 (8)	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median 1.859 (49) 1.985 (17) 1.809
(SC259) Overall Spring Summer-Fall Winter Kansas River at Lecompton (SC257) Overall	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median 0.31 (221) 0.355 (74) 0.38 (54)	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median 98 (217) 147.5 (72)	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity Median 40 (221)	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median 6.342 (41) 7.2775 (14) 6.7535 (10)	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl Median 1.292 (49)	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli Median 85 (27) 70.5 (8) 120 (7)	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median 1.859 (49) 1.985 (17) 1.809 (11)
(SC259) Overall Spring Summer-Fall Winter Kansas River at Lecompton (SC257) Overall Spring	Median 0.27 (179) 0.33 (63) 0.3 (45) 0.22 (71) TP Median 0.31 (221) 0.355 (74) 0.38	Median 88 (179) 122 (63) 88 (45) 37 (71) TSS Median 98 (217) 147.5 (72) 132	Median 35 (179) 53 (63) 44 (45) 16 (71) Turbidity Median 40 (221) 57.4 (74)	Median 5.996 (46) 7.282 (16) 6.004 (12) 5.1195 (18) TOC Median 6.342 (41) 7.2775 (14) 6.7535	Median 0.948 (53) 1.5075 (18) 0.973 (13) 0.7215 (22) Kjeldahl Median 1.292 (49) 1.672 (17)	Median 62 (31) 74.5 (10) 110 (8) 31 (13) E. coli Median 85 (27) 70.5 (8)	Median 1.676 (53) 2.1385 (18) 1.582 (13) 1.4615 (22) TN Median 1.859 (49) 1.985 (17) 1.809

Stream chemistry data from KDHE monitoring stations on the Kansas River by season and overall. Number in parenthesis is sample size.



